SOCIAL CONTEXT MATTERS

Facilitated Differential Pain-related Fear Learning in a Threatening Social Context

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Introduction

- **Pain-related fear** plays an important role in the development and maintenance of **chronic pain**, and is a major focus in current treatment for chronic pain[1]
- **Factors facilitating the development of perpetual maladaptive fear are unknown**, making the prevention of chronic pain challenging.
- A novel approach: The study of pain in relation to social contextual factors. **Social context** modulates the appraisal, interpretation, and experience of pain[2], which might make it a feasible target for prevention.

Aim: **The current study investigated the effects of a threatening and a safe social context on pain-related fear using an established differential voluntary fear conditioning paradigm (i.e., the "Voluntary Joystick Movement (VJM) Paradigm")[3].**

Hypotheses: A **threatening social context** compared to a safe social context leads to:

1) Enhanced (i.e., faster / stronger) acquisition of pain-related fear
2) Slower extinction of pain-related fear
3) Increased pain intensity ratings
4) Increased contextual fear
   a. Increased baseline startle responses
   b. Increased startle responses during the inter trial intervals (ITI)
   c. Slower reaction times

Methods

Stimuli

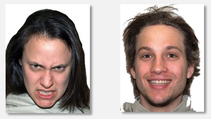
Unconditioned Stimulus (US)

Pain-US
Electrocutaneous stimulation
(*M* = 33.79 mA; SD = 18.35)

Conditioned Stimulus (CS)

Proprioceptive Stimuli
left/right movements

Social Context Manipulation



Facial stimuli
Angry (*threat group*) or happy (*safe group*) facial stimuli[4]

Participants & Design

N = 42 healthy participants (12 ♂)
Age: 17-29 years old
2 groups: Threat (*n*=21) vs. Safe (*n*=21

During acquisition a shock followed the left movement (CS+), but not the right movement (CS-).

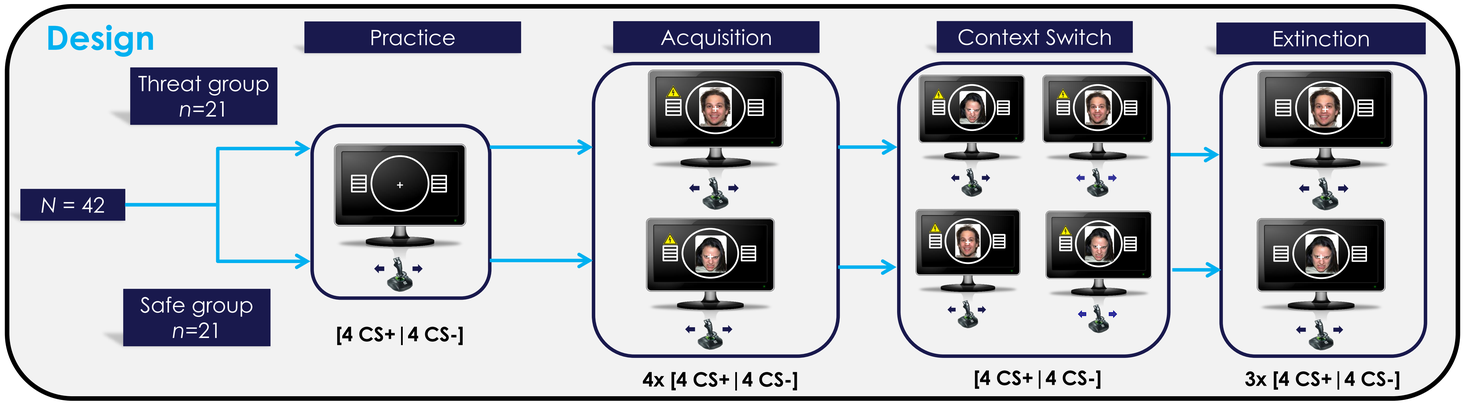
Measures

Self-report measures (0-10):
- Pain expectancy
- Pain-related fear
- Pain intensity
- Threat of pain

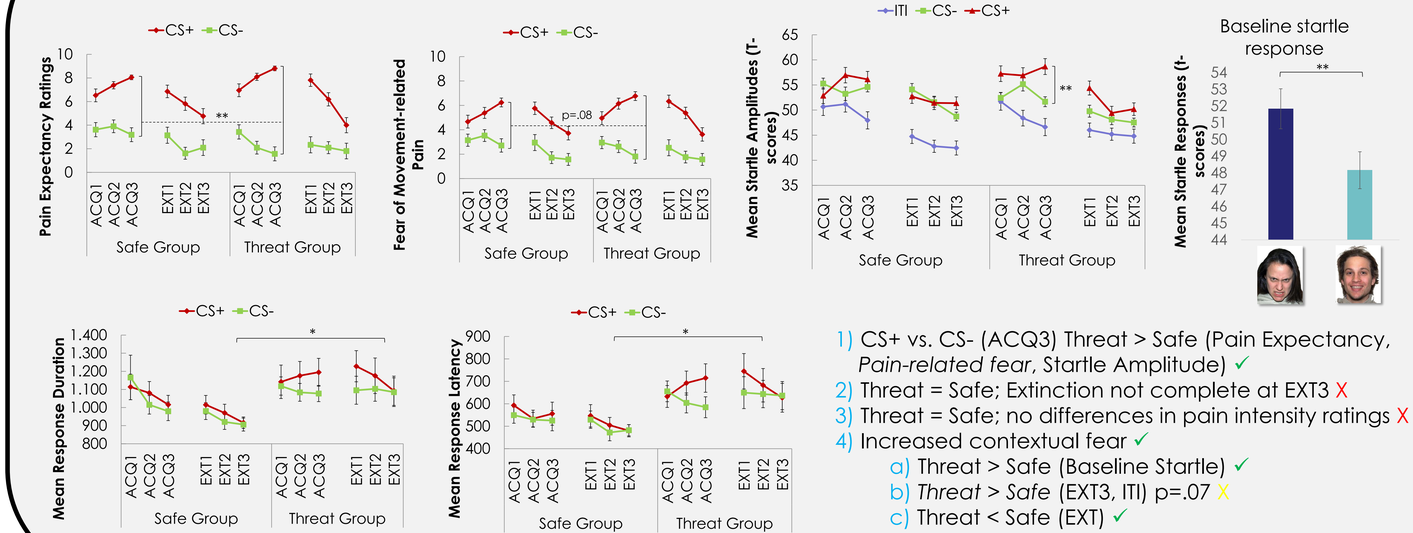
Behavioral measures:
- Movement-onset latency
- Response duration

Psychophysiological measures:
- Eyeblink startle modulation elicited by startle probes (white noise, 100 dB)

Design



Results



1) CS+ vs. CS- (ACQ3) Threat > Safe (Pain Expectancy, *Pain-related fear*, Startle Amplitude) ✓
2) Threat = Safe; Extinction not complete at EXT3 X
3) Threat = Safe; no differences in pain intensity ratings X
4) Increased contextual fear ✓
   a) Threat > Safe (Baseline Startle) ✓
   b) *Threat* > *Safe* (EXT3, ITI) p=.07 X
   c) Threat < Safe (EXT) ✓

Note: * = p<.05 | ** = p<.01

Conclusion

A threatening social context
1. **leads to contextual fear** - Behavioral "freezing" and increased physical arousal[5]
2. **facilitates differential fear learning** - Evolutionary "preparedness" to distinguish between threat and safety[6] / threatening context motivates efficient differential learning
3. **Does not affect pain intensity ratings**
4. **Does not modulate extinction of pain-related fear**

Summary: Exposure to a threatening social context affects the perception of pain by modulating pain-related fear and contextual fear. Increased clinical and scientific attention to the effects of social context in acute and chronic pain conditions is warranted.

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References:
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